



LANDAU
ASSOCIATES,
INC.

Environmental and Geotechnical Services

RECEIVED

APR 13 1995

SUPERFUND REMEDIAL BRAND

COLSF 8.4 VI

TRANSMITTAL

TO: Distribution List

Date: April 11, 1995

Project No.: 124004.31

RE: COLBERT LANDFILL REMEDIAL ACTION PROJECT OPERATIONAL STATUS AND EVALUATION
PROCEDURES

Copies

Description

1

Revised Figure B of the Colbert Landfill March 20, 1995 Meeting Memorandum

Please replace Figure B of the Colbert Landfill March 20, 1995 Meeting Memorandum that was transmitted to you on April 6, 1995 with the attached revised Figure B. The revisions to Figure B are as follows:

- 1) The zone of TCA above the Performance Standard Concentration of 200 µg/L was expanded to the south to include well locations that were not sampled in 1994 but were sampled previous to 1994 and reported to contain TCA concentrations above 200 µg/L. This revision was also made to reflect Figure K of the meeting memorandum.
- 2) The previous Figure B included with the March 20, 1995 meeting memorandum indicated that a well log was available for well 0273F-1, however, a well log is not available for this well and the attached Figure B was revised to reflect this.

DISTRIBUTION

| | |
|-----------------|-------------------|
| Michael Kuntz | Ecology |
| Neil Thompson | EPA |
| Dean Fowler | Spokane County |
| William Wedlake | Spokane County |
| John Markus | Landau Associates |
| Lawrence Beard | Landau Associates |

USEPA SF



1454886

LANDAU ASSOCIATES, INC.

By:

John A. Markus

JAM:hyk



LANDAU
ASSOCIATES,
INC.

Environmental and Geotechnical Services

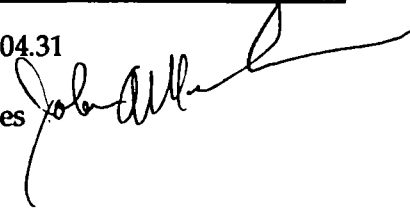
RECEIVED

APR 07 1995

SUPERFUND REMEDIAL BRANCH

MEETING MEMORANDUM

TO: List of Attendees, Project File No. 124004.31

FROM: John A. Markus, P.E., Landau Associates 

DATE: April 6, 1995

MEETING DATE/LOCATION: March 20, 1995 / EPA Seattle Office

PURPOSE: COLBERT LANDFILL REMEDIAL ACTION PROJECT
OPERATIONAL STATUS AND EVALUATION
PROCEDURES

ATTENDEES:

| Name | Firm | Phone |
|-----------------|-------------------|----------------|
| Michael Kuntz | Ecology | (206) 407-7239 |
| Neil Thompson | EPA | (206) 553-7177 |
| Dean Fowler | Spokane County | (509) 456-3604 |
| William Wedlake | Spokane County | (509) 456-3604 |
| John Markus | Landau Associates | (206) 778-0907 |
| Lawrence Beard | Landau Associates | (206) 778-0907 |

This memorandum is intended to be a fair transcription of the discussions of the meeting. Any discrepancies should be brought to the attention of Landau Associates as soon as possible.

The meeting was held to discuss and resolve issues identified by EPA and Ecology in their letter to Spokane County dated February 28, 1995. All issues identified by Ecology and EPA in the subject letter were discussed and general agreement was reached by attendees for either direct resolution or an approach for achieving resolution. The topics of discussion, pertinent facts and disposition of each respective issue are presented in the following paragraphs in the order of discussion during the meeting.

1. Definition of the Contaminant Plume

Landau Associates presented the proposed supplemental sampling program that was prepared for implementation by Spokane County. Figure A was presented to illustrate the location for and other pertinent information related to the selection of each proposed supplemental well to be sampled in the upper aquifer. A total of 19 wells were identified to be included in the supplemental sampling of the upper aquifer. Table 1 was presented to indicate

the bases for identification of the respective domestic wells included in the routine domestic well sampling program and the wells recommended for inclusion in the supplemental sampling program. Table 2 was presented to define the date of the most recent sampling and the concentration of a key contaminant of concern, such as TCA, associated with the upper aquifer groundwater at the proposed supplemental sampling locations.

Similarly, Figure B was presented to illustrate the location for and other pertinent information related to the selection of each proposed supplemental well to be sampled in the lower aquifer. A total of 22 wells were proposed to be included in the supplemental sampling of the lower aquifer. Table 3 was presented to indicate the bases for identification of the respective domestic wells included in the routine domestic well sampling program and the wells recommended for inclusion in the supplemental sampling program. Table 4 was presented to define the date of the most recent sampling and the concentration of a key contaminant of concern, such as TCA, associated with the lower aquifer groundwater at the recommended supplemental sampling locations.

Landau Associates and Spokane County emphasized that there was some uncertainty that all of the wells could be sampled, since many of the wells had not been sampled for 5 years or more. Spokane County informed EPA and Ecology that many of the owners of the wells included in the proposed supplemental sampling activity were now connected to the Whitworth Water District distribution system under the Alternative Water Supply program; Whitworth Water District has required that Owners desiring to keep their well connected to their private distribution system to install and maintain an approved backflow prevention device on the municipal water supply line to assure protection of public health from an illegal cross connection. Additionally Spokane County explained that some of the wells could be inoperable, demolished, collapsed, or in accessible (i.e. refusal of the property Owner to allow sampling of well), so it might not be possible to sample all of the wells identified in the proposed supplemental sampling program.

EPA and Ecology commended Spokane County for taking the initiative to develop the supplemental sampling program and stated that they strongly supported the proposed sampling effort. Ecology asked when Spokane County would be prepared to implement the program. Spokane County informed that they were prepared to commence sampling within 2 days, but it could take 4 weeks to fully implement the program. Ecology encouraged Spokane County to proceed with the implementation of the supplemental sampling. All parties agreed that the implementation of the supplemental sampling by Spokane County was solely at the discretion

of Spokane County and that implementation of the supplemental sampling at this time would not obligate Spokane County to accomplish such supplemental sampling in the future.

2. Domestic Well Sampling Program

Spokane County inquired if EPA and Ecology were still comfortable with the existing agreement, whereby EPA and Ecology had designated Scott Fink at Washington State Department of Health and Grace Garrison's group to serve as their representatives. Ecology and EPA confirmed their support of the program as currently implemented. Ecology noted that the purpose of the domestic well sampling program was to protect human health from ingestion or adverse exposure to contaminated water; hence not all the data collected from the program was necessarily germane to tracking the distribution of contamination originating at from the landfill.

3. Rationale for Defining Wells as Representative of Specific Aquifers

Landau Associates distributed copies of the well drillers logs for those domestic wells that logs are known to exist. It was stated that wells were allocated to the respective units of the upper and lower aquifer based factors including but not necessarily limited to, well construction logs, measured depth to water, well capacity, and specific yield were factors. Tables were presented that identified the parameters used for designation of the wells in the upper and lower aquifer, respectively.

Spokane County addressed Ecology's and EPA's concerns regarding the domestic well sampling protocol. Whenever possible Spokane County draws the sample at the wellhead prior to any pressure tank. Spokane County explained that if sampling could not be accomplished prior to the pressure tank, then the volume of the pressure tank and the associated piping was included in the computation of well purge volume.

4. Occurrence of Contamination Along the Little Spokane River

The occurrence of contamination in wells along the Little Spokane River was discussed. Landau Associates explained that natural advection processes were responsible for the westerly and southerly migration of contaminated groundwater in the upper aquifer. The existence of the bluff to the west of the landfill allowed a portion of the upper aquifer to "daylight" as evidenced by the appearance of springs at the base of the bluff. Landau Associates presented

Figures C and D to illustrate the apparent slug flow characteristics of the contaminant plume migration.

Unfortunately the figures were mislabeled and the mechanism of progressive southerly migration of a single contaminant slug is not supported by the data. Figure D was mislabeled and erroneously identified as the North Glen Estates well; the correct identification for the well is 1073E-2, which is the (b) (6) well. The data indicate that a contaminant slug passed through the (b) (6) well prior to the (b) (6) well. Because the (b) (6) well is south of the (b) (6) well, the data do not support southerly migration of a single slug of contaminants. However, the data do indicate the migration of a contaminant slug (rather than a continuing source) at both locations. It was also noted that the concentration of contamination in either (b) (6) well or (b) (6) well has not exceeded maximum adjustment control criteria (Table V-1) established by the consent decree. Consequently, the present level of monitoring appears to be adequate. Spokane County stated that they were carefully monitoring the quality of water in the (b) (6) well and the concentrations appeared to have peaked and were on the decline. Spokane County reminded EPA and Ecology that the (b) (6) well was placed on monthly sampling program a little over a year ago but was recently placed back on the regular quarterly monitoring program because the 12-month average concentration of the contaminants of concern in groundwater samples was found to be less than 65 percent of the evaluation criteria.

It was agreed to evaluate this issue further after the results of the supplemental sampling are available. For the record, the TCA concentrations in the groundwater at the North Glen well are presented on Figure E; the trend is similar to that observed at the (b) (6) well but at a much lower concentration.

5. Migration of Contaminants East and North of the Landfill

The anomalous northward and eastward migration of contamination from the landfill was discussed. Landau Associates presented a summary table of well drillers pump test data (Table 5) and Figures F and G to illustrate the performance characteristics of the respective wells. The data indicate that most of the existing wells east and northeast of the landfill are characterized by low production. Pumping test drawdown data collected at these wells, with the exception of those wells completed in the Lower Sand/Gravel Aquifer, exceeded more than 50 ft at very low pumping rates. This suggests a possible mechanism for transport of contamination seemingly upgradient.

6. Occurrence of Vinyl Chloride

Landau Associates presented Table 6 to identify all known detectable concentrations of vinyl chloride in the groundwater within the remedial action area. Vinyl chloride has only been detected in the groundwater in close proximity to the landfill. The occurrence of vinyl chloride appears to be strongly correlated with high concentrations of identified "constituents of concern," namely TCA and TCE. Spokane County informed EPA and Ecology that vinyl chloride has never been detected in the groundwater samples collected and analyzed for the domestic well sampling program, which includes thousands of analyses. Ecology noted that vinyl chloride could increase in the future due to the natural biological degradation of the chlorinated solvents. Landau Associates commented that the risk for formation of vinyl chloride was generally considered greater for the halogenated alkenes such as DCE, TCE, and PCE, as compared to halogenated alkanes such as TCA and DCA.

Ecology noted that at other sites, such as Western Processing, they have observed a gradual increase in the vinyl chloride concentrations while the concentrations of the original contaminants of concern have decreased significantly. Landau Associates informed EPA and Ecology that the existing treatment facility would be extremely effective in stripping detectable vinyl chloride from the extracted water should concentrations increase in the future. Landau Associates suggested that the high Henry's Law constant and vapor pressure of vinyl chloride would likely cause very low concentrations of vinyl chloride to be stripped from the water by the conventional air aspirator installed on most sink faucets. Ecology noted that ingestion of vinyl chloride water was not the most significant route of exposure and inhalation from exposure in the shower during bathing was considered to be a very significant route of exposure.

Landau Associates noted that the current monitoring programs included routine analysis for vinyl chloride and that it had not be proposed to abbreviate the analytical methodologies to exclude vinyl chloride. It was also noted that vinyl chloride had not been detected in the combined influent groundwater conveyed to the treatment facility and it had never been detected in the effluent from the treatment facility. All attendees agreed that the existing compliance monitoring program and domestic well sampling program provided adequate assurance to protect human health and the environment regarding vinyl chloride.

7. Location of Compliance Monitoring Wells

Landau Associates reviewed the concepts identified in the consent decree for establishing the locations for compliance monitoring wells. Landau Associates apologized for introducing

the term "crossgradient monitoring well" into the aquifer management plan, because this term is not referred to in the consent decree. The consent decree requires that extraction wells be extended laterally across the plume, and that extraction wells be added to the interception system until the concentration of a given extraction well was below the adjustment control criteria. The wells at the outside limits of the interception system (where concentrations are below the adjustment control criteria) are to be monitored similar to downgradient monitoring wells, and are referred to in the consent decree as outboard monitoring wells. There is no requirement in the consent decree that these outboard monitoring wells be outside the interception system capture zone.

There was considerable discussion over the issue of whether it was acceptable for downgradient monitoring wells to be located in the capture zone of the extraction wells. Landau Associates referred EPA and Ecology to the footnote on page V-5 of consent decree, which defined the terms upgradient and downgradient as " the groundwater gradient under nonpumping, steady state conditions unless otherwise indicated," which supports Spokane County's position that the consent decree allows for (and specifically addresses) the potential location of downgradient monitoring wells inside the capture zone. All parties reviewed Figures J and K, and there was general concurrence that the present monitoring system should detect any significant concentration of the constituents of concern that might migrate through or around the interception system regardless of whether the downgradient monitoring wells are inside or outside the capture zone. EPA and Ecology agreed to reconsider their position on this matter, once they had the opportunity to review the supplemental sampling results, and stated they were generally comfortable with the present locations of the monitoring wells.

did we agree?
concurred w/ Landau to wait and see.

The upper aquifer downgradient monitoring system was discussed. Landau Associates noted that in the vicinity of the extraction wells, the upper aquifer appeared to have a much stronger easterly trending flow component than recognized prior to installation of the Phase II monitoring and extraction wells. Spokane County stated that they were not aware of any wells in the upper aquifer east of (b) (6) in near proximity to the remedial action area that could be monitored. The area remains undeveloped. All parties agreed that further discussion on the issue of downgradient water quality monitoring should be reserved until the results of the supplemental sampling were assessed. The results from wells 1473N-1 (b) (6) and CD-35 will be of particular interest. Spokane County stated that the access problems associated with CD-34 and CD-35 had been resolved with the property owner.

8. Institutional Controls for Domestic Well Construction

Spokane County raised the issue about future domestic wells possibly being installed in the remedial action area. Spokane County requested assistance from EPA and Ecology in establishing appropriate institutional controls for the Colbert Landfill remedial action area. Spokane County noted that the Eastern Division of Ecology had established a benchmark for institutional controls with the General Electric PCB site. Ecology agreed to look into the procedures related to the General Electric site and determine if there was a precedent to follow that might help in developing the institutional controls at Colbert.

9. Seasonal Fluctuations in the Groundwater Levels

Landau Associates presented Figures H and I to illustrate the apparent lack of seasonal and annual variation in the groundwater levels in the upper and lower aquifers, respectively, prior to operation of the remedial action facilities. Ecology and EPA stated that the information appeared to indicate a general lack of seasonal variability. Landau Associates elaborated on the two generally accepted methods for evaluating the hydraulic performance of pump and treat systems. Where there is normally little or no seasonal fluctuation in the groundwater levels, the method of using target drawdowns as proposed in the aquifer management plan is typically effective and easily implemented. The other method commonly employed is based on changes in differential water surface elevations between monitoring wells located at differing distance from the extraction well. Ecology inquired why the comparisons of the groundwater elevation contours at different periods could not be used to demonstrate hydraulic performance of the system. Landau Associates explained that the procedure of evaluating differential head measurements between wells was a more quantitative method that provided the same information as comparing groundwater elevation contour maps. Spokane County proposed to evaluate the effectiveness of the two described methods under conditions of high and low groundwater extraction rates. It was agreed that such an evaluation would need to be accomplished during a period of low gradient recharge (late summer or early fall) to allow evaluation of aquifer response of the full range of operational conditions.

10. Effective Time for Commencement of Sampling

It was mutually agreed that the sampling, analytical, and operational data collection period for the project officially began on July 1, 1994. Operational and analytical data collected in May and June were not discredited, but were associated more with facility startup and

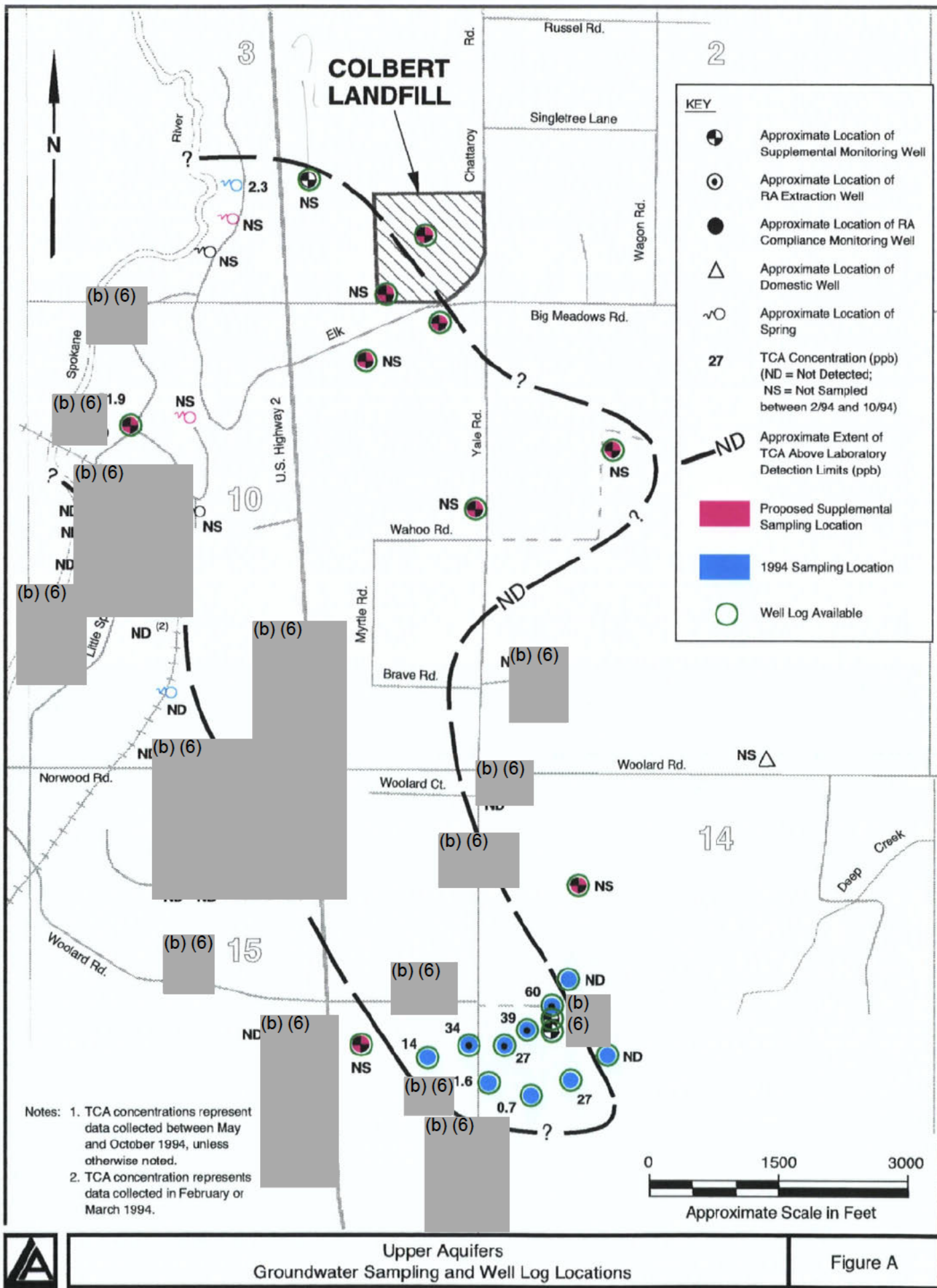
operational testing rather than representative of routine operation of the remedial action facilities.

11. Quarterly Reports

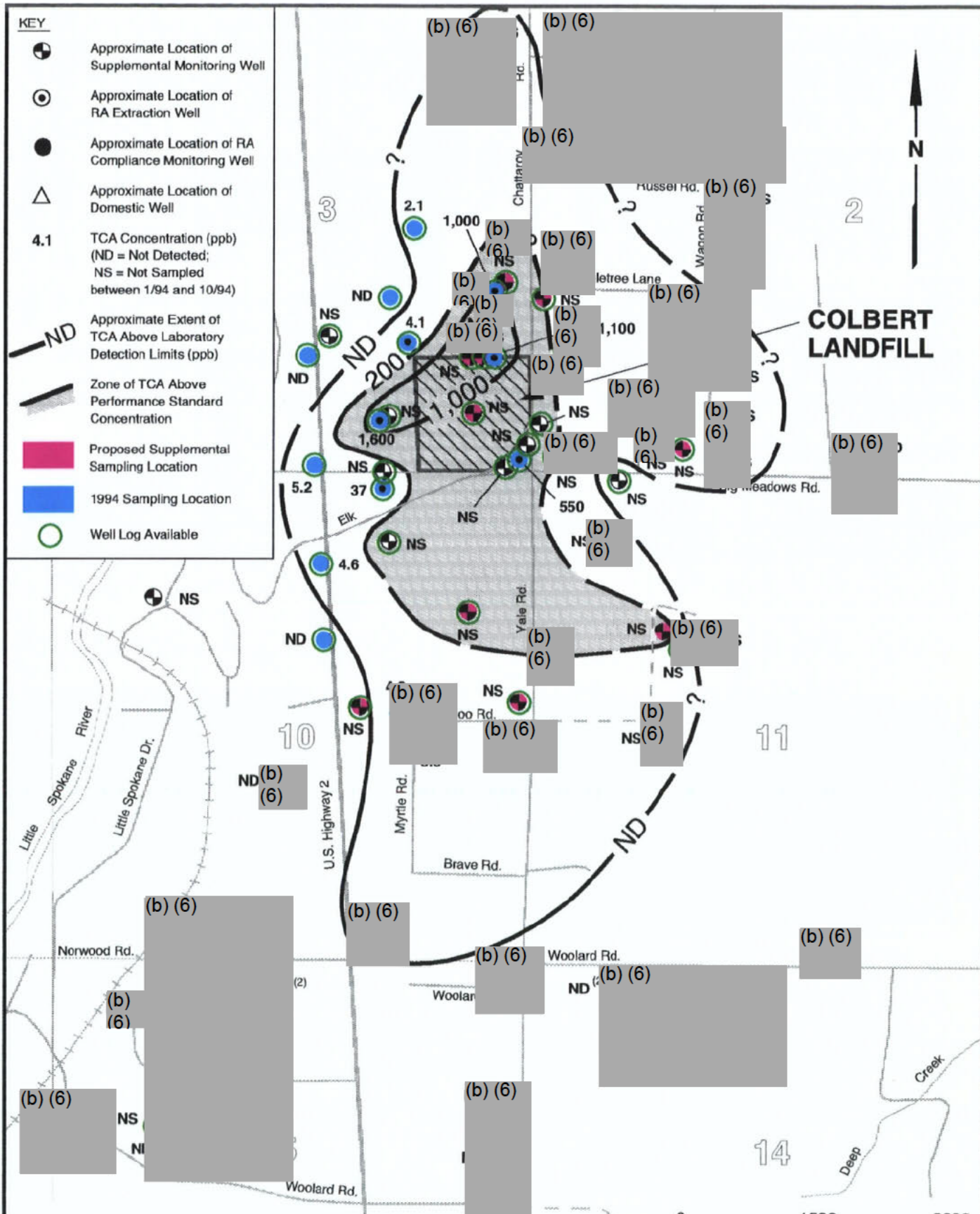
Ecology and EPA informed that they had reviewed the third quarter report for 1994 and found the report to be well written and presented. Ecology stated that they would be forwarding some minor comments on the report, but these comments would not require that the third quarter report to be revised or resubmitted. Spokane County stated that the fourth quarter report for 1994 would probably be submitted in mid-April. Ecology and EPA stated that the revised schedule for submittal would be fine.

12. Future Meetings

It was mutually agreed that the meeting was very beneficial to communicating current activities on the project to the agencies. Spokane County proposed that similar meetings be held either in person or by telephone conference call at approximately monthly intervals. Ecology and EPA concurred with the proposal. It was agreed that the next meeting would occur by telephone conference during the third week of April 1995.



- KEY**
- Approximate Location of Supplemental Monitoring Well
 - Approximate Location of RA Extraction Well
 - Approximate Location of RA Compliance Monitoring Well
 - Approximate Location of Domestic Well
 - 4.1** TCA Concentration (ppb)
(ND = Not Detected;
NS = Not Sampled
between 1/94 and 10/94)
 - Approximate Extent of TCA Above Laboratory Detection Limits (ppb)
 - Zone of TCA Above Performance Standard Concentration
 - Proposed Supplemental Sampling Location
 - 1994 Sampling Location
 - Well Log Available



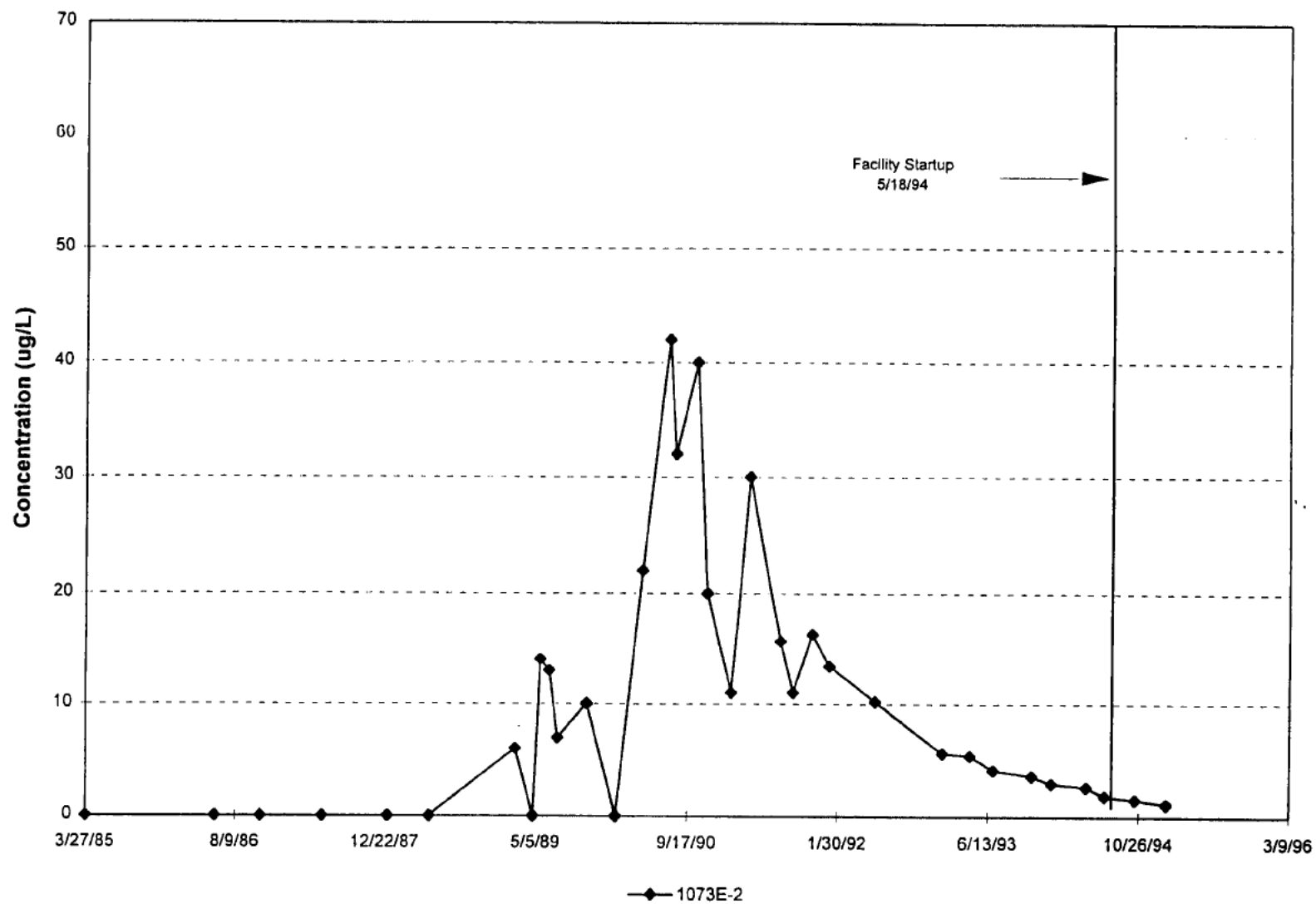
Notes: 1. TCA concentrations represent data collected between May and October 1994, unless otherwise noted.
2. TCA concentration represents data collected in January, February, or March 1994.

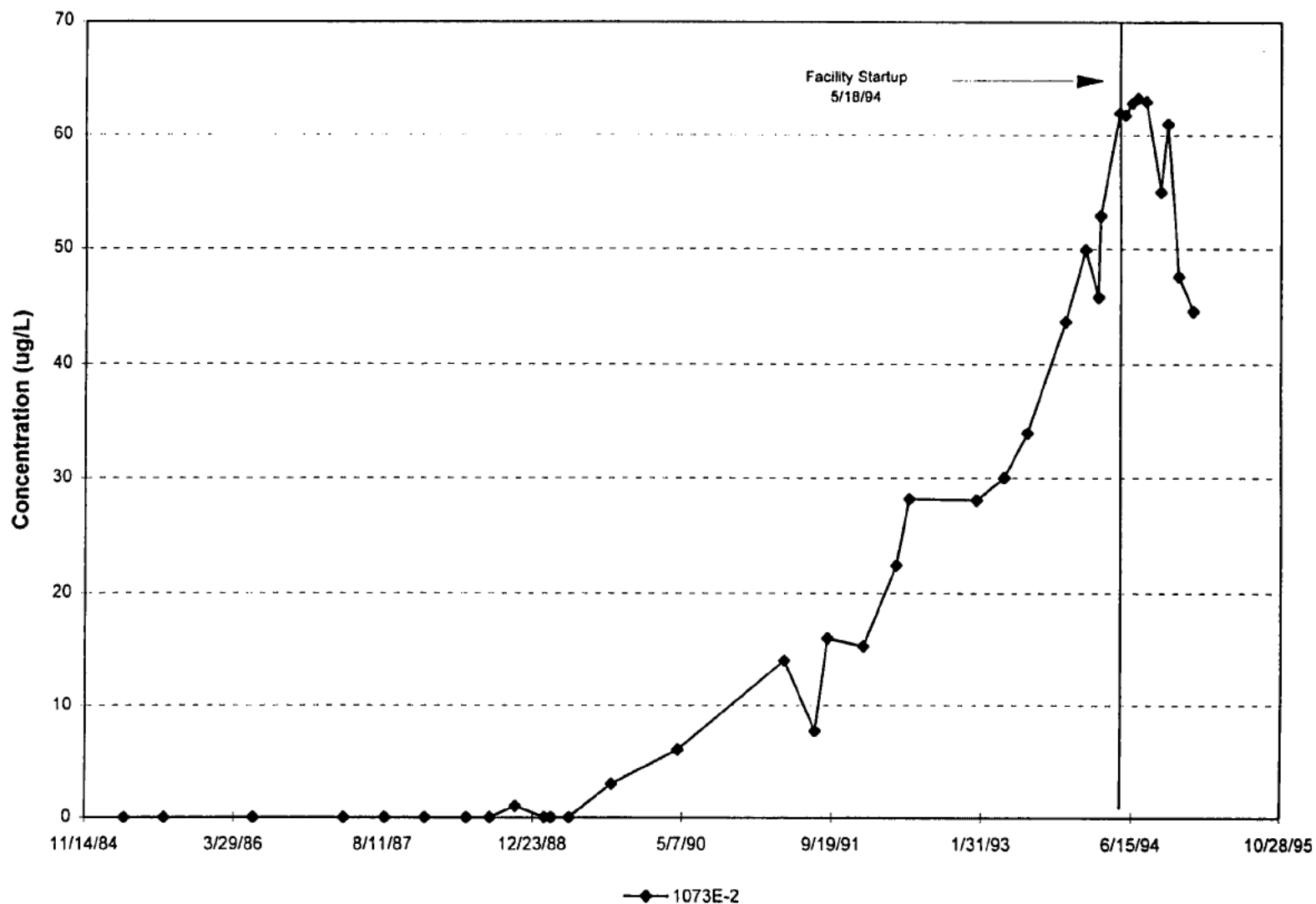
0 1500 3000
Approximate Scale in Feet



Lower Aquifers
Groundwater Sampling and Well Log Locations

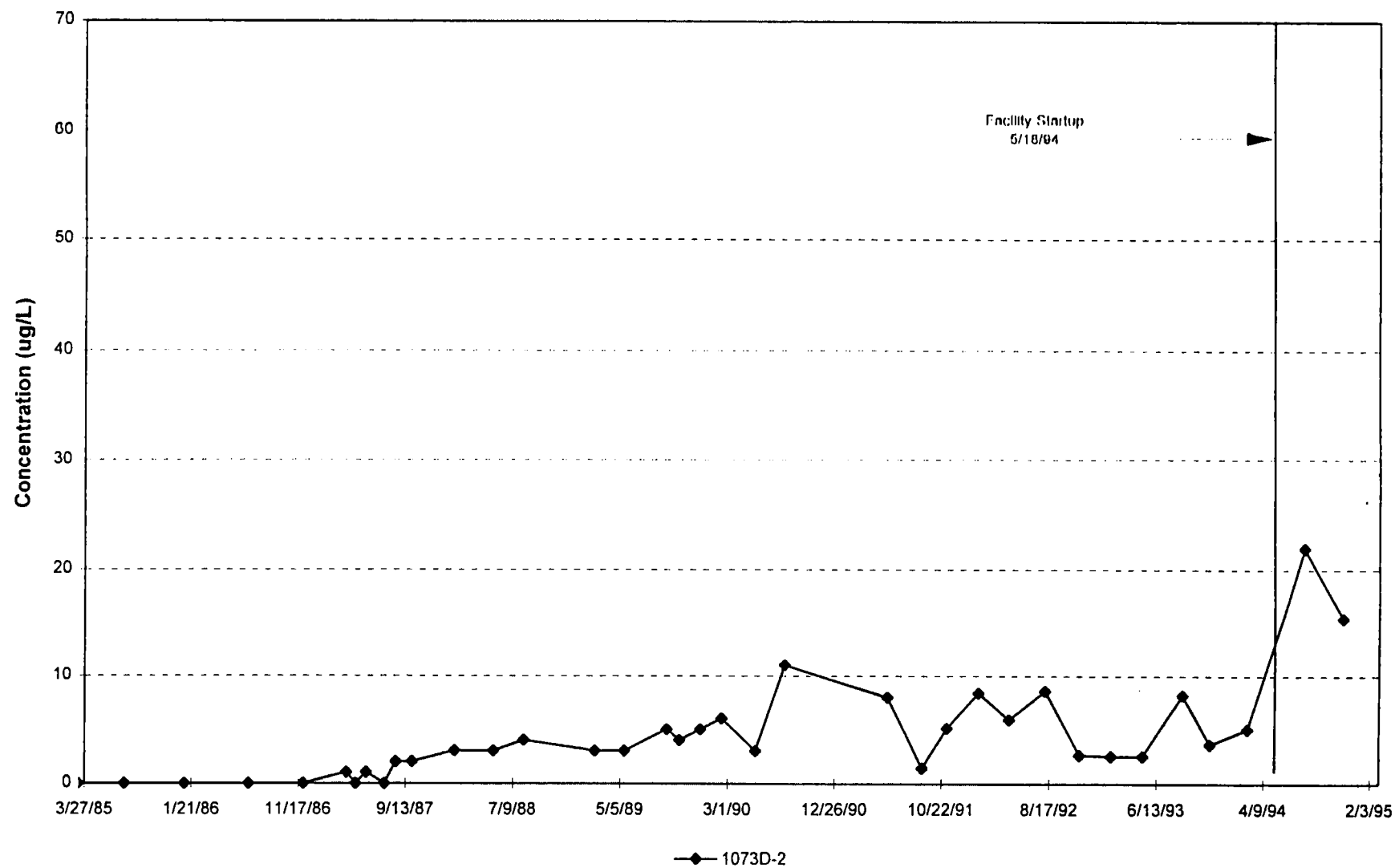
Figure B





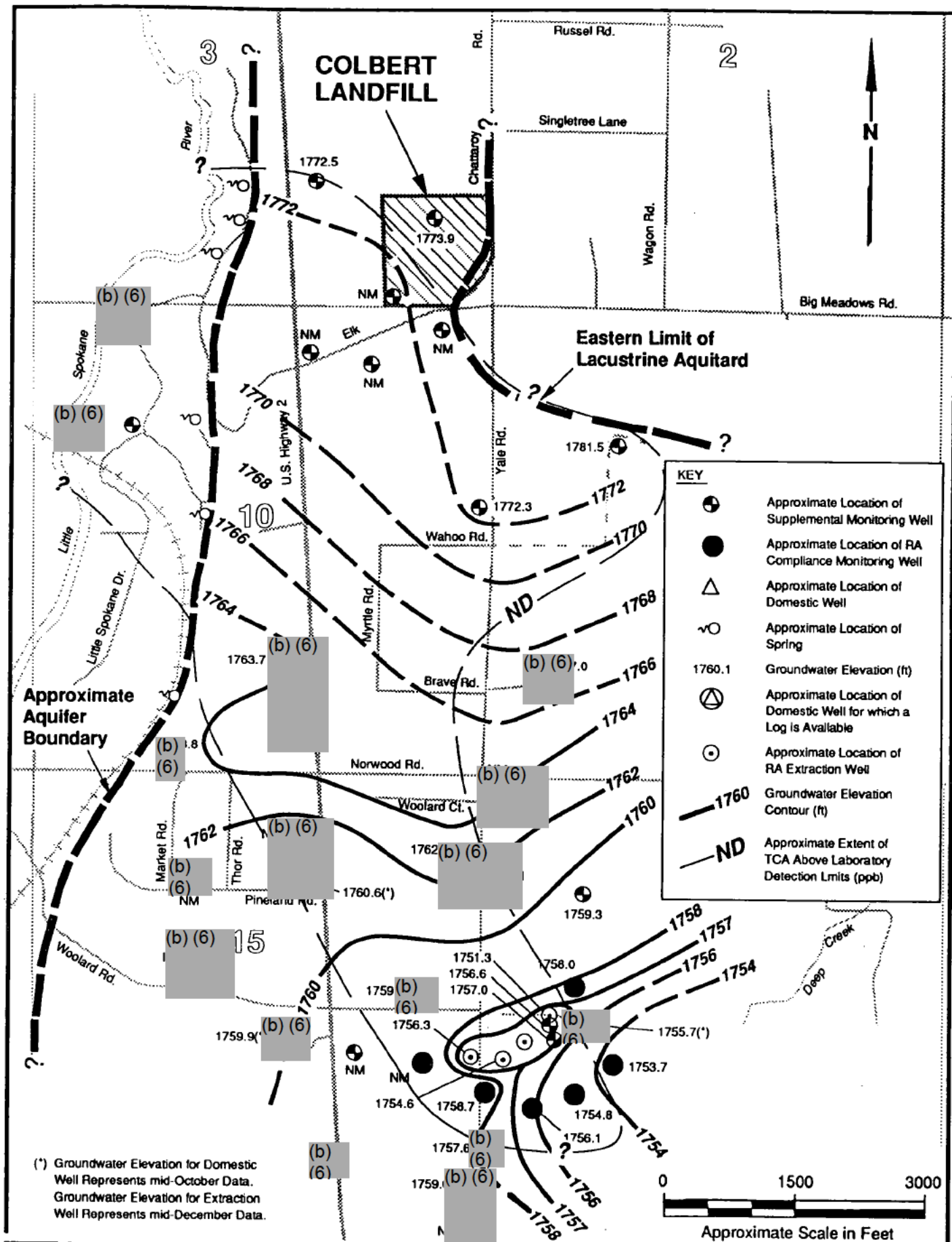
TCA vs. Time for Well 1073E-1 (b) (6)

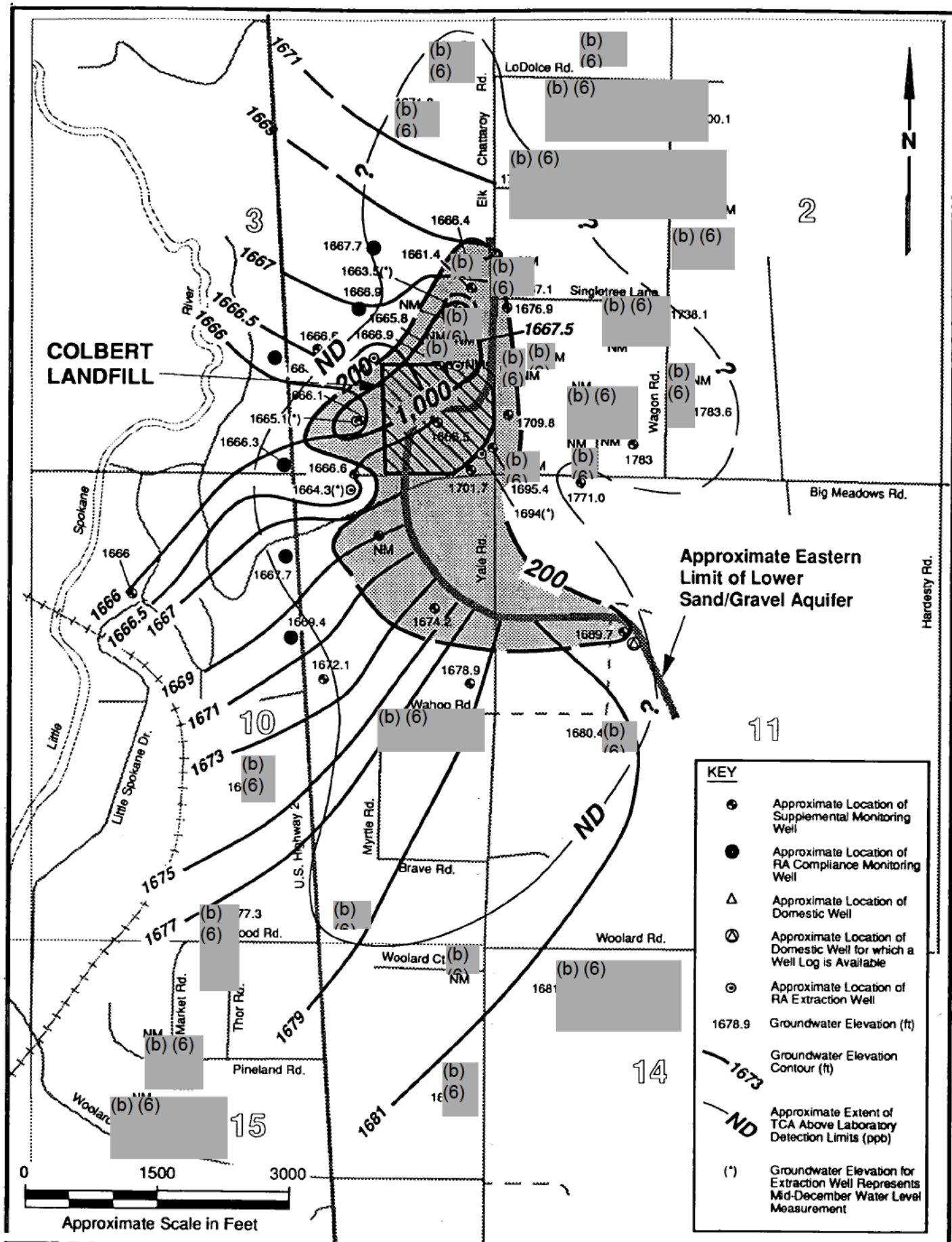
Figure D



TCA vs. Time for Well 1073D-2 (North Glen)

Figure E





Lower Sand/Gravel Aquifer
Groundwater Elevation Contours, November 1994 (Pumping)

Figure K

TABLE 1
COLBERT LANDFILL
DOMESTIC WELL SUMMARY
UPPER AQUIFER

| Well ID | Well Owner's Name ^(a) | Well Log Available | Approximate Depth to Groundwater (ft) | Date Last Sampled (Prior to 1995) | Proposed Supplemental Sampling Location |
|-----------------------|----------------------------------|--------------------|---------------------------------------|-----------------------------------|---|
| DOMESTIC WELLS | | | | | |
| 1073D-1 | (b) (6) | Yes | 3 | 09/22/94 | |
| 1073D-2 | North Glen Estates | Yes | 5 | 08/02/94 | |
| 1073E-1 | (b) (6) | No | 6 | 10/13/94 | |
| 1073E-2 | | No | 18 | 10/13/94 | |
| 1073E-3 | | No | 17 | 10/13/94 | |
| 1073K-1 | | Yes | 79 | 4/21/90 | / |
| 1073L-1 | | No | 20 | 09/19/94 | |
| 1073L-2 | | No | 15 | 02/24/94 | |
| 1073L-3 | | No | 29 | 06/14/94 | |
| 1073M-1 | | No | 16 | 03/02/94 | |
| 1073M-2 | | No | 6 | 02/24/94 | |
| 1073M-3 | | No | 13 | 06/14/94 | |
| 1073M-4 | | No | 6 | 10/18/94 | |
| 1073N-1 | | No | 6 | 03/03/94 | |
| 1073P-2 | | No | 74 | 08/03/94 | |
| 1073Q-1 | | Yes | | 1990 | |
| 1073Q-2 | | No | | 1988 | / |
| 1073Q-3 | | No | | 1990 | / |
| 1173N-1 | | No | 91 | 07/15/94 | |
| 1473D-2 | | No | 85 | 09/23/94 | |
| 1473D-3 | | No | 93 | 1988 | / |
| 1473M-1 | | No | 82 | 10/17/94 | |
| 1473N-1 | | No | 85 | 1987 | / |
| 1573A-1 | | No | 94 | 1986 | / |
| 1573B-2 | | No | 85 | 1990 | / |
| 1573B-4 | | No | 88 | 1990 | / |
| 1573B-5 | | No | 82 | 09/22/94 | |
| 1573C-2 | | No | | 05/24/94 | |
| 1573C-7 | | No | 83 | 10/17/94 | |
| 1573C-8 | | No | 79 | 07/07/94 | |
| 1573H-4 | | No | 95 | 1990 | / |
| 1573K-1 | | Yes | 89 | 10/17/94 | |
| 1573Q-1 | | No | 79 | 07/06/94 | |
| 1573R-1 | | No | 92 | 09/23/94 | |
| 1573R-2 | | No | 65 | 09/23/94 | |

(a) May not be most recent owner.

Shading indicates routine 1994 domestic groundwater well sampling program and proposed supplemental sampling wells.

TABLE 2
COLBERT LANDFILL
HISTORICAL SAMPLING DATA FOR
PROPOSED SUPPLEMENTAL GROUNDWATER SAMPLING LOCATIONS
UPPER AQUIFER

| Proposed Supplemental Sampling Location | Date Last Sampled | TCA Concentration (ug/L) |
|--|----------------------|-----------------------------|
| Monitoring Wells | | |
| CD-02A1 | 6/21/93 | 16 |
| CD-03A1 | 6/2/93 | 37 |
| CS-03A1 | 1/13/84 | 48 |
| CS-04A1 | 6/3/93 | 2.5 |
| CD-06A1 | 6/4/93 | 190 J |
| CS-13 | 10/25/84 | 600 |
| CD-23B1 | 6/8/93 | 140 |
| CD-32B1 | 6/8/93 | ND |
| CD-35A1 | 5/25/93 | ND |
| CD-40C1 | 5/26/93 | 160 J |
| Domestic Wells | | |
| 1073K-1 | 4/21/90 | 120 |
| 1073Q-2 | 8/8/88 | 151 |
| 1073Q-3 | 8/8/90 | 227 |
| 1473D-3 | 5/15/88 | ND |
| 1473N-1 | 2/27/87 | ND |
| 1573A-1 | 2/1/86 | 318 |
| 1573B-2 | 6/20/90 | 70 |
| 1573B-4 | 7/18/90 | 30 |
| 1573H-4 | 6/20/90 | 247 |
| Springs | | |
| 1073C-1S | 4/21/90 | 18 |
| 0373P-1S | 6/20/90 | 48 |

TABLE 3
COLBERT LANDFILL
DOMESTIC WELL SUMMARY
LOWER AQUIFER

| Well ID | Well Owner's Name ^(a) | Well Log Available | Approximate Depth to Groundwater (ft) | Date Last Sampled (Prior to 1995) | Proposed Supplemental Sampling Location |
|-----------------------|----------------------------------|--------------------|---------------------------------------|-----------------------------------|---|
| DOMESTIC WELLS | | | | | |
| 0273C-1 | (b) (6) | Yes | 87 | 1993 | |
| 0273C-2 | | Yes | 99 | 1990 | |
| 0273C-3 | | No | 96 | 10/17/94 | |
| 0273C-4 | | No | 100 | 08/03/94 | |
| 0273C-5 | | No | 93 | 07/02/94 | |
| 0273D-1 | | No | 140 | 10/17/94 | |
| 0273D-2 | | Yes | 192 | 1992 | |
| 0273D-3 | | Yes | 192 | 1992 | |
| 0273D-6 | | No | 142 | 08/03/94 | |
| 0273E-1 | | Yes | 132 | 1990 | ✓ |
| 0273E-2 | | No | 199 | 01/07/94 | |
| 0273E-3 | | Yes | 165 | 1990 | ✓ |
| 0273F-2 | | No | 189 | 09/22/94 | |
| 0273F-3 | | Yes | 158 | 1989 | |
| 0273F-4 | | Yes | 92 | 06/13/94 | |
| 0273F-5 | | Yes | | Abandoned ? | |
| 0273L-2 | | Yes | 216 | 1989 | |
| 0273L-3 | | No | | 1990 | ✓ |
| 0273M-1 | | Yes | 197 | 1989 | ✓ |
| 0273M-2 | | Yes | 174 | 1990 | ✓ |
| 0273N-2 | | Yes | 185 | ?? | |
| 0273N-5 | | Yes | 209 | 1986 | |
| 0273N-6 | | Yes | 176 | 1989 | |
| 0273N-7 | | Yes | 89 | 1986 | ✓ |
| 0273N-8 | | Yes | 77 | 1984 | |
| 0273P-1 | | Yes | 77 | 1989 | |
| 0273P-3 | | Yes | 79 | 1991 | ✓ |
| 0273P-4 | | Yes | 149 | 1988 | |
| 0273P-5 | | No | 83 | 1990 | ✓ |
| 0273Q-1 | | No | 58 | 05/24/94 | |
| 0373A-1 | | No | | 10/18/94 | |
| 0373A-2 | | No | 170 | 06/13/94 | |
| 0373A-4 | | No | 205 | 08/03/94 | |
| 0373J-1 | | Yes | 192 | 1989 | ✓ |
| 0373J-3 | | Yes | 189 | 1989 | ✓ |
| 0373J-4 | | Yes | 189 | 1983 | |
| 0373J-5 | | Yes | 190 | 1990 | ✓ |
| 1073G-1 | | No | 183 | 07/06/94 | |

TABLE 3
COLBERT LANDFILL
DOMESTIC WELL SUMMARY
LOWER AQUIFER

| Well ID | Well Owner's Name ^(a) | Well Log Available | Approximate Depth to Groundwater (ft) | Date Last Sampled (Prior to 1995) | Proposed Supplemental Sampling Location |
|----------|----------------------------------|--------------------|---------------------------------------|-----------------------------------|---|
| 1073J-1 | (b) (6) | Yes | 189 | 10/12/94 | |
| 1073J-2 | Wahoo Water Dist. | Yes | 179 | 09/22/94 | |
| 1073L-4 | (b) (6) | No | 166 | 03/03/94 | |
| 1073P-3 | | Yes | 160 | 1993 | |
| 1073Q-4 | N. Meadows Wtr. Co. | No | 172 | 09/22/94 | |
| 1173D-1 | (b) (6) | No | 101 | 1989 | ✓ |
| 1173F-1 | | No | | 1987 | ✓ |
| 1173F-2 | | Yes | 156 | 1987 | |
| 1173L-1 | | Yes | 172 | 1990 | ✓ |
| 1473C-1 | | No | 131 | 01/10/94 | |
| 1473C-2 | | Yes | 183 | 10/17/94 | |
| 1473C-3 | | Yes ^(c) | 160 | 03/04/94 | |
| 1473C-4 | | Yes | 163 | 06/16/94 | |
| 1473C-5 | | Yes | 168 | 09/22/94 | |
| 1473D-1 | | No | 170 | 02/22/94 | |
| 1573A-2 | N. Meadows/(b) (6) | Yes | 94 | 1985 | |
| 1573C-10 | (b) (6) | No | 128 | 07/07/94 | |
| 1573C-14 | | No | 158 | 09/23/94 | |
| 1573C-15 | | No | 163 | 01/07/94 | |
| 1573C-16 | | Yes | 165 | 1993 | |
| 1573C-17 | | Yes ^(c) | 166 | 03/03/94 | |
| 1573D-1 | | No | 87 | 06/16/94 | |
| 1573E-2 | | Yes | 146 | 09/23/94 | |
| 1573E-3 | | Yes | 162 | 1993 | |
| 1573F-1 | | Yes | 190 | 1990 | |
| 1573F-4 | | No | 164 | 5/26/94 | |
| 1573H-1 | | No | 166 | 01/07/94 | |
| 1573H-2 | | No | 164 | 07/08/94 | |

- (a) May not be most recent owner.
 (b) Only one well of two will be sampled.
 (c) Location description on well log is unclear.

Shading indicates routine 1994 domestic groundwater well sampling program and proposed supplemental sampling wells.

TABLE 4
COLBERT LANDFILL
HISTORICAL SAMPLING DATA FOR
PROPOSED SUPPLEMENTAL GROUNDWATER SAMPLING LOCATIONS
LOWER AQUIFER

| Proposed Supplemental Sampling Location | Date Last Sampled | TCA Concentration (ug/L) |
|--|----------------------|-----------------------------|
| Monitoring Wells | | |
| CD-01C2 | 6/7/93 | 1600 |
| CD-02C2 | 6/9/93 | 690 |
| CD-04E1 | 6/3/93 | 2500 |
| CD-05C2 | 6/1/93 | ND |
| CD-06C2 | 6/4/93 | 20 |
| CD-08E1 | 6/17/93 | 820 |
| CS-14C1 | 6/14/93 | 150 |
| CD-21C1 | 5/28/93 | 1200 J |
| CD-24C2 | 6/1/93 | 2000 |
| CD-23C2 | 6/4/93 | 310 J |
| Domestic Wells | | |
| 0273E-1 | 9/17/90 | 412 |
| 0273E-3 | 7/18/90 | 197 |
| 0273L-3 | 6/20/90 | ND |
| 0273M-1 (a) | 6/19/87 | 3700 |
| 0273M-2 (a) | 10/18/89 | 1352 |
| 0273N-7 | 10/31/86 | 686 |
| 0273P-3 | 6/13/91 | 41 |
| 0273P-5 | 5/18/90 | 197 |
| 0373J-1 (b) | 10/18/89 | 1013 |
| 0373J-3 (b) | 7/4/89 | 2050 |
| 0373J-5 | 5/18/90 | 51 |
| 1173D-1 | 10/27/89 | 45 |
| 1173F-1 | 6/22/87 | ND |
| 1173L-1 | 6/20/90 | 21 |

(a) Either domestic well 0273M-1 or 0273M-2 are recommended as supplemental sampling locations; however, it is recommended that only one be sampled.

(b) Either domestic well 0373J-1 or 0373J-3 are recommended as supplemental sampling locations; however, it is recommended that only one be sampled.

TABLE 5
COLBERT LANDFILL
DOMESTIC WELL
WELL DRILLER PUMPING TEST DATA

| Well ID | Well Owner's Name ^(a) | Aquifer | Drawdown (ft) | Pumping Rate (gpm) | Duration (hr) |
|---------|----------------------------------|-------------------|---------------|--------------------|---------------|
| 0273F-1 | (b) (6) | Latah | 66 | 18 | 4 |
| 0273F-3 | | Latah | ~100 | 10 | 4 |
| 0273M-2 | | Lower Sand/Gravel | 12 | 10 | 2 |
| 0273N-2 | | Granite | 75 | 5 | 4 |
| 0273N-6 | | Latah | 90 | 5 | 2 |
| 0273P-3 | | Basalt | 35 | 10 | 4 |
| 0273P-4 | | Granite | 200 | 1.5 | 3 |
| 0373J-1 | | Lower Sand/Gravel | 0 | 15 | 2 |
| 0373J-3 | | Lower Sand/Gravel | 0 | 15 | 3 |
| 0373J-4 | | Lower Sand/Gravel | 0 | 15 | 1 |

(a) May not be most recent owner.

TABLE 6
COLBERT LANDFILL
GROUNDWATER SAMPLES
DETECTED VINYL CHLORIDE

| Location | Collection Dat | Sample Identification | Lab Identification | Vinyl Chloride (ug/L) | TCA (ug/L) | | TCE (ug/L) |
|----------|----------------|-----------------------|--------------------|-----------------------|------------|---|------------|
| CD04E1 | 06/03/93 | 9571 | | 8.4 | 2500 | J | 19 |
| CD21C1 | 05/28/93 | 9558 | | 4.6 | 1200 | J | 2.0 |
| CD21C1 | 05/28/93 | 9557 | | 4.8 | 1600 | J | 2.8 |
| CD24C2 | 05/15/90 | 9147 | | 3.0 | 2000 | | 24 |
| CD24C2 | 06/01/93 | 9561 | | 18 | 1600 | J | 36 |
| CD24C2 | 06/01/93 | 9564 | | 17 | 2000 | J | 30 |
| CD46C2 | 10/10/91 | 9469 | | 2.5 | 3100 | | 5 |
| CD46C2 | 10/10/91 | 9470 | | 2.8 | 2500 | | 4.9 |
| CPE1C2 | 05/14/90 | 9145 | | 3.1 | 3000 | | 58 |
| CPE1C2 | 07/22/94 | 289 | K944431-004 | 2.8 | 1100 | | 44 |
| CPE1C2 | 09/26/94 | 320 | K945964-005 | 2.2 | 1100 | | 26 |
| CPE1C2 | 11/14/94 | CP-E1-9411 | K947173-005 | 1.4 | 1100 | | 25 |
| CPE1C2 | 12/19/94 | CP-E1-941219 | K947907-005 | 1.4 | 540 | | 16 |
| CPW3C2 | 09/26/94 | 325 | K945964-010 | 1.0 | 1600 | | 9.6 |
| CPW3C2 | 11/14/94 | CP-W3-9411 | K947173-010 | 0.8 | 1400 | | 13 |
| CPW3C2 | 11/14/94 | CP-D1-9411 | K947173-011 | 0.5 | 1500 | | 13 |
| CPE2E2 | 06/15/94 | 264 | K943670-013 | 0.8 | 460 | | 270 |
| CPE2E2 | 09/26/94 | 321 | K945964-006 | 1.2 | 550 | | 370 |

Vinyl Chloride was detected in 18 groundwater samples of 348 groundwater samples collected from groundwater monitoring wells and/or extraction wells that were analyzed for vinyl chloride (i.e. samples from domestic wells have not been included in this statistic). Also vinyl chloride has not been detected in any samples collected from the influent to the treatment facility nor in samples of the effluent from the treatment facility.